
FINAL ENVIRONMENTAL ASSESSMENT

**SURFSIDE BEACH
SHORELINE PROTECTION PROJECT
BRAZORIA COUNTY, TEXAS**



FEDERAL EMERGENCY MANAGEMENT AGENCY



August 2007

Final Environmental Assessment

**Surfside Beach
Shoreline Protection Project**

**Prepared for:
FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION VI**

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LIST OF ACRONYMS

CFR	Code of Federal Regulations
CMP	Coastal Management Program
CEPRA	Coastal Erosion Planning and Response Act
CIAP	Coastal Impact Assistance Program
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impacts
GLO	Texas General Land Office
MHHW	mean high higher water
NAAQS	National Ambient Air Quality Standards
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
PINS	Padre Island National Seashore
PTube	ProTecTube III
RCRA	Resource Conservation and Recovery Act
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

1.1 Project Authority

On September 24, 2005, President Bush declared a major disaster as a result of damage due to Hurricane Rita (FEMA-1606-DR-TX). As a direct result of Hurricane Rita's storm surge and intense wave action along the Village of Surfside Beach shoreline, severe erosion and damage occurred resulting in losses to the shoreline and damage to structures located along the beach. The Federal Emergency Management Agency (FEMA) is considering funding the construction of a revetment structure to be located along the seaward side of Beach Drive to provide protection to Beach Drive and public infrastructure landward of Beach Drive. The shoreline is currently approximately 120 feet from Beach Drive and has lost approximately 30 feet per year due to erosion from 2004 to 2006 (Texas General Land Office [GLO] 2007). Without protection against beach erosion, the roadway and public infrastructure could be damaged or lost entirely in future storm events.

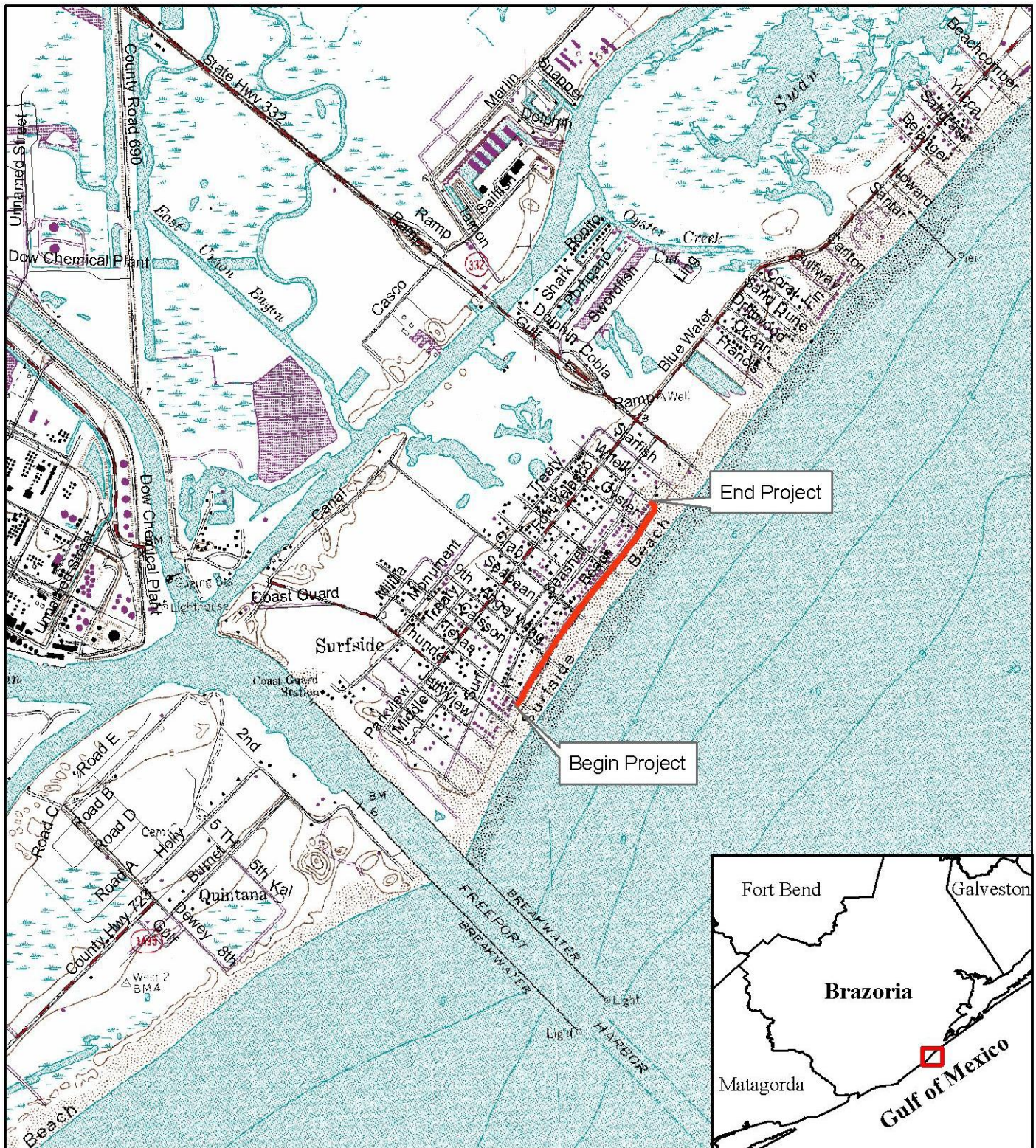
In accordance with the Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 93-288, as amended, and implementing regulations at 44 Code of Federal Regulations (CFR) Part 206, FEMA is required to review the environmental effects of the proposed action prior to making a funding decision. In accordance with 44 CFR, Part 10, FEMA has prepared this Environmental Assessment (EA) to meet the requirements of Section 102 of the National Environmental Policy Act of 1969 (NEPA). The purpose of this EA is to analyze the alternatives and assess the potential environmental impacts associated with the proposed construction of a revetment structure to be located along the beach in the Village of Surfside Beach, Texas.

1.2 Project Location

The project site is located in Brazoria County within the Village of Surfside Beach city limits along the Gulf of Mexico shoreline (see *Figure 1*). The proposed revetment structure would be constructed along the seaward side of Beach Drive beginning 150 feet west of Texas Street and continuing uninterrupted to the east approximately 3,500 feet to Whelk Street (see *Figure 1* and *Appendix A*).

2.0 PURPOSE AND NEED

The Village of Surfside Beach is a small community in Brazoria County located on the Gulf of Mexico with a population of 763 (U.S. Census Bureau 2000). As a direct result of storm surge and intense wave action from Hurricane Rita, the Village of Surfside Beach has experienced severe erosion along its shoreline. Additionally the project shoreline has experienced approximately 2 to 12 feet of erosion per year between 1956 and 1996 and has lost approximately 30 feet per year from 2004 to 2006 (GLO 2007). The receding shoreline has resulted in the vegetation line moving inland to the edge of Beach Drive which is now vulnerable to breaching from future storm events. In addition to Beach Drive, the utilities that are adjacent to this road are at risk as well. The purpose of the proposed project is to provide protection to Beach Drive and public infrastructure landward of Beach Drive against erosion and breaching during storm events.



Source: Freeport USGS 7.5-minute Topographic Quadrangle Map (revised in 1974)

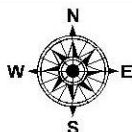
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Parcel Boundary (Approximate)

FIGURE 1
LOCATION MAP
SHORELINE PROTECTION PROJECT
SURFSIDE BEACH, TEXAS

SCALE

0 500 1,000 2,000 3,000 4,000 Feet



DATE: AUGUST 2007

TCB | AECOM



Source: Texas Natural Resources Information System,
2004 National Agriculture Imagery Program (NAIP)

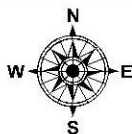
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Proposed Revetment

FIGURE 2
AERIAL PHOTOGRAPH MAP
SHORELINE PROTECTION PROJECT
SURFSIDE BEACH, TEXAS

SCALE

0 125 250 500 750 1,000 Feet



DATE: AUGUST 2007

TCB | AECOM

3.0 ALTERNATIVES

3.1 No Action

The No Action alternative would entail no construction of a revetment structure for the Village of Surfside Beach. The project shoreline has experienced approximately 2 to 12 feet of erosion per year between 1956 and 1996 and has lost approximately 30 feet per year from 2004 to 2006 (GLO 2007). Consequently, Beach Drive and public infrastructure landward of Beach Drive would be left unprotected and erosion would continue unabated if no action were taken to protect the shoreline from erosion. If the beach erosion continues at its current rate, Beach Drive, the public utilities and homes landward of Beach Drive are at risk during the next storm event. The total estimated monetary value of these facilities is approximately \$8,909,255 (Kelly Hamby, Village of Surfside, telephone conversation, June 7, 2007). A storm with a magnitude of a strong northern (less than a one year return period) could result in wave damage on the road base.

3.2 Proposed Action

The Village of Surfside Beach has prepared and submitted an application for FEMA funding under FEMA's Public Assistance program being administered in response to FEMA-1606-DR-TX. The proposed action is to construct a revetment structure to provide protection to Beach Drive and public infrastructure against erosion and breaching during a two-year storm event. The proposed revetment structure would be constructed along the seaward side of Beach Drive starting 150 feet west of Texas Street and continuing uninterrupted to the east approximately 3,500 feet to Whelk Street. The revetment would be constructed with large stones and would be built from the edge of Beach Drive no more than 20 feet seaward. *Appendix A* shows a plan view and typical sections of the proposed structure. Some of the benefits associated selecting this alternative would be ease of construction, relatively low construction cost (\$1.5-2.0 million), and good performance in storms with up to five-foot waves. Some negative aspects of selecting this alternative would be that it is a hard structure and it has poor aesthetics.

This proposed project is part of a larger, phased project, which if funded, would help to reduce long-term shoreline erosion at Surfside Beach. Phase 1 is underway and involves concrete debris removal and the demolition, removal and/or relocation of homes currently located on the beach. The proposed action described in this EA would be Phase 2, revetment construction. The completion of Phase 1 is not dependent on the start of Phase 2. Phase 3 is underway and involves a Shoreline Feasibility Study initiated by the GLO to identify causes of accelerated erosion along the Village of Surfside Beach shoreline and to develop, analyze and select feasible alternatives to prevent and/or reduce shoreline erosion. The goal of this study is to identify structural or non-structural engineered alternatives to stabilize the shoreline for the next 25 years. Phase 4 of the project would consist of designing and implementing the projects developed during Phase 3. In preparation of Phase 4, the Village of Surfside Beach signed a resolution on June 12, 2007 which authorizes the mayor to proceed with the application for Coastal Erosion Planning and Response Act (CEPRA) and Coastal Impact Assistance Program (CIAP) funding for a beach nourishment, dune reconstruction and beach stabilization project. It should be noted that Phase 2, revetment construction, is the only project being evaluated under this EA.

A comment was received from the TPWD (see letter dated July 13, 2007 in *Appendix F*) including recommendations in regard to Phases 3 and 4. As noted above, Phases 3 and 4 are outside of the scope of this EA.

3.3 Alternatives Considered but not Carried Forward

There were a number of alternatives considered but not carried forward. These alternatives were eliminated from consideration due to cost and/or feasibility. In addition, these alternatives are not practicable alternatives, due to the current state of the beach in front of the project area. It is littered with remnants of pier and beam foundations, damaged beach front homes and debris as a result of Hurricane Rita. These alternatives are as follows:

ProTecTube III (PTube) Dune – The PTube Dune alternative consists of a patented geotextile container covered with at least three feet of sand. The PTube is a geotextile container with three independent compartments that form a flat base 25 feet wide with a sloping top side. The ramped containers reach a height of five feet when filled with sand. The containers are hydraulically filled with a sand slurry mix that allows sand to remain in the container.

- Some of the benefits associated with this alternative are:
 - good performance under storm conditions for waves up to two to three feet in height
 - reduction of wave reflection and toe scour
 - stability due to wide footprint
 - reduction of overtopping
- Some negative aspects associated with this alternative are:
 - difficult to construct and replace
 - timeline for delivery of materials
 - high cost (\$2.5-3.0 million)
 - the material is prone to storm damage particularly in areas with concrete rubble
 - does not allow for drainage from flooding, storm surges, overtopping, and sheet flow

Geotube Dune – The Geotube dune alternative(s) consists of standard geosynthetic tubes in lieu of the PTube core. The geotube alternative consists of various geotube sizing and stacking configurations so that the performance and shape would be similar to a PTube. This alternative also includes a sand cover similar to that proposed for the PTube alternative.

- Some of the benefits of this alternative are:
 - good performance in minor storms with waves under three feet in height
 - easy to construct
 - materials are readily available
 - reduction of overtopping
- Some of the negative aspects of this alternative are:
 - the material is prone to storm damage particularly in areas with significant amount of concrete rubble
 - wave reflection may cause toe erosion
 - unstable
 - easily damaged under differential settlement
 - moderate cost (\$2.0-2.5 Million)
 - hard to repair

- poor aesthetics
- does not allow for drainage from flooding, storm surges, overtopping, and sheet flow

4.0 AFFECTED ENVIRONMENT AND IMPACTS

4.1 Geology and Soils

Brazoria County is located in the southeastern part of Texas, along the Gulf of Mexico. Most of the county is in the Gulf Coast Prairies Major Land Resource Area. The lower part of the county, which is dominantly salty soils, is in the Gulf Coast Marsh Resource Area. The land surface in the region can be characterized generally as broad and nearly level. The few sloping areas are mostly adjacent to the San Bernard River, Brazos River, and Oyster Creek. The land surface slopes upward from the southeast to the northwest. The elevation rises from sea level to about 75 feet in the northwestern part of the county. Most drainage flows to the southeast through Linville Bayou, San Bernard River, Oyster Creek, Brazos River, Bastrop Bayou, and Clear Creek. The San Bernard River and the Brazos River empty directly into the Gulf of Mexico. The other bayous and creeks empty directly into the bays directly adjacent to the Gulf of Mexico. Brazoria County has a warm humid climate with precipitation averaging 52 inches per year (U.S. Department of Agriculture [USDA] 1981).

The project site is located on Follets Island along the Gulf of Mexico shoreline (see *Figure 1*). This section of shoreline lies within a littoral cell marked to the west by the Freeport channel and jetties constructed in the late 1800's at the old location of the Brazos River mouth and to the east by San Luis Pass (West Galveston Bay).

The Geologic Atlas of Texas, Beeville-Bay City Sheet, indicates the subject property is underlain by Quaternary-age deposits consisting of beach ridge and barrier-flat sand deposits (Aronow 1975). The general soil map indicates that the project is mapped as containing Mustan-Veston soils. These soils are sandy and loamy, poorly drained, rapidly permeable and slowly permeable soils; and can be found in marshes. The soil map unit for the project site is listed as "beaches" (USDA 1981).

The Farmland Protection Policy Act (FPPA) (P.L. 97-98, Sec. 1539-1549; 7 U.S. Code 4201, et seq.) was enacted to minimize the unnecessary conversion of farmland to non-agricultural uses as a result of federal actions. The Natural Resources Conservation Service (NRCS) is responsible for protecting significant agricultural lands from irreversible conversions that result in the loss of an essential food or environmental resource. Prime farmland is characterized as land with the best physical and chemical characteristics for the production of food, feed, forage, fiber, and oilseed crops. This land is either used for food or fiber crops or is available for those crops, but is not urban, built-up land, or water areas. Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. The site is mapped as beaches which is not suitable for use as prime farmland.

The proposed project does not contain Important Farmland Soils. The site is mapped as beaches which is not Prime Farmland. Additionally the area is already converted to urban land. The FPPA excludes from the definition of "farmland" areas that contain more than 30 structures per 40 acres.

Alternative A – No Action: The No Action alternative would have no impacts on the soils or geology of the area. Beach Drive and public infrastructure would be left unprotected and erosion would continue unabated.

Alternative B – Construct Revetment Structure: The revetment would protect Beach Drive and public infrastructure by reducing erosion during storm events. Construction of a revetment structure at the site would cause some disturbance of the beach as part of the site preparation work. Some excavation would be required in order to place the revetment in its desired location. Exposed soils could be subject to erosion, therefore, silt fence and/or other storm water runoff best management practices would be utilized during construction. In general, effects to geology and soils would be minor and temporary in nature.

4.2 Water Resources

4.2.1 Surface Water

The project area is located on Follets Island which is bounded to the west by the Freeport Harbor Channel, to the east by San Luis Pass (West Galveston Bay), the Gulf of Mexico along the seaward shore, and the Intracoastal Waterway along its landward shore. There are no rivers, creeks or other defined drainages on the project site. Stormwater that is not absorbed into the ground leaves the sight as sheet flow and drains into the Gulf of Mexico. There are no wild and scenic rivers, as designated under the Wild and Scenic Rivers Act, in the project area.

Alternative A – No Action: The No Action alternative would not change the site drainage nor have an effect on the surface water quality of the area.

Alternative B – Construct Revetment Structure: Potential impacts to surface waters associated with the construction of the revetment structure include the potential for erosion and sedimentation during construction. Some minor grading and excavation would be needed as part of the site preparation work. During this period, storm water runoff could carry sediment offsite into receiving waters. A Storm Water Pollution Prevention Plan would be prepared and erosion and sedimentation control measures would be implemented to minimize any detrimental effects to water quality during construction.

Because the project would disturb more than one acre, a Texas Commission on Environmental Quality (TCEQ) Texas Pollutant Discharge Elimination System (TPDES) storm water permit would be required. This permit would require that a copy of the Storm Water Pollution Prevention Plan is kept on the construction site and that all sediment control measure identified in this plan are maintained. Any adverse effects to water quality associated with the construction of the revetment would be short term and be minimized by use of best management practices. No long-term effects to water quality are expected as a result of the proposed project.

4.2.2 Waters of the United States (U.S.) Including Wetlands

The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged or fill material into waters of the U.S., including wetlands, pursuant to Section 404 of the Clean Water Act. Section 10 (33 U.S.C. 403) of the Rivers and Harbors Appropriations Act establishes a program to regulate activities affecting navigation in United States waters, including wetlands. Wetlands are identified as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation

typically adapted for life in saturated soil conditions. In addition, Executive Order 11990, Protection of Wetlands, directs federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the values of wetlands on federal property.

Under Section 404 of the Clean Water Act, a permit is required from the USACE for any activities involving the discharge of dredged or fill material into waters of the U.S., including wetlands and tidally influenced waters. Dependent on the scope and type of impacts to waters of the U.S., authorizations may be in one of three primary forms: general permit, a letter of permission, or a standard individual permit. Section 10 of the Rivers and Harbors Appropriation Act regulates construction, excavation, or deposition of materials in, over, or under such waters, or any work which would affect the course, location, condition, or capacity of those waters.

A review of the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map of the area was also conducted in order to identify the potential for wetlands and/or other waters of the U.S. This review indicated there was no presence of wetlands located within the immediate vicinity of the project area (USFWS 1992). A site visit to the project area verified that there were no potential wetlands or waters of the U.S. subject to Section 404 on the property. Since the project site is located on the beach there are potential Section 10 impacts; however a survey conducted and certified by an Licensed State Land Surveyor in May 2006 put the mean high higher water (MHHW) at an elevation of 1.89 feet above North American Vertical Datum of 1988 (NAVD88). The proposed project is to be located above the MHHW and is landward of this line. Since the project is to be located above the MHHW, the project would be located above the upper limit of USACE jurisdictional limits. Therefore, the proposed project location would not occur within jurisdictional waters of the U.S. (see letter in *Appendix B*).

Alternative A – No Action: The No Action alternative would have no effect on wetlands or other waters of the U.S. and would not require a Section 404 or Section 10 permit.

Alternative B – Construct Revetment Structure: The jurisdictional limits of the USACE extend from the MHHW line seaward. The MHHW line occurs at an elevation of 1.89 feet above NAVD88. The project is located above this elevation and is outside of USACE jurisdictional limits. There would be no impacts to jurisdictional waters of the U.S.

4.2.3 Floodplains

Executive Order 11988 (Floodplain Management) requires federal agencies to avoid or minimize development in the floodplain except when there are no practicable alternatives. According to the National Flood Insurance Program's Flood Insurance Rate Map (Community-Panel Number 48039C0785-I revised May 4, 1992), the project site is located within the 100-year floodplain and is designated as Zone VE, which is a coastal flood with velocity hazard (wave action) with a base flood elevation of 15 feet. *Appendix C* discusses the floodplain planning process, includes a FEMA floodplain map and a coordination letter from the Village of Surfside Beach Floodplain Administrator.

The construction of the revetment would take place within the designated 100-year floodplain. To comply with Executive Order 11988, Floodplain Management, FEMA is required to follow the procedure outlined in 44 CFR Part 9 to assure that alternatives to the proposed action have been considered. This process, also known as the "Eight Step Planning Process," has been applied to the

proposed action and is described in *Appendix C*. For the purposes of this study, there are no practicable alternatives to the proposed action.

No adverse effects to the floodplain are expected as a result of the construction of the revetment. Coordination with the Village of Surfside Beach floodplain administrator has been performed (see letter in *Appendix C*). The Village of Surfside Beach floodplain administrator had no objection to the proposed action. The final design of the proposed flood protection wall would undergo review for floodplain and drainage issues through the Village of Surfside Beach development review process.

Alternative A – No Action: The No Action alternative would not result in impacts to the 100-year floodplain.

Alternative B – Construct Revetment Structure: The proposed project is located within the 100-year floodplain. Construction of the revetment structure is not anticipated to have any impacts on the base flood elevation, but since it is located in the coastal floodplain it would require a review under Executive Order 11988.

4.3 Biological Resources

4.3.1 Flora and Fauna

The project area is located in the Gulf Coast Prairies and Marshes natural region of Texas, as depicted in *Preserving Texas' Natural Heritage* (LBJ School of Public Affairs 1978). The prairies and marshes of the Texas Gulf Coast are among the richest grazing lands in the state. This region is also an excellent habitat for upland game and waterfowl and an important recreational hunting and fishing area (Hatch 1999). The project area has been developed with beach front homes on both sides of Beach Drive. The homes on the seaward side of Beach Drive were severely damaged from erosion caused by Hurricane Rita.

The project occurs within the “Marsh/Barrier Island” vegetation type as described by the Texas Parks and Wildlife Department (TPWD) in *The Vegetation Types of Texas* (TPWD 1984). Commonly associated species of this region include black rush (*Juncus roemerianus*), vidrillos (*Batis maritima*), black mangrove (*Avicennia germinans*), glasswort (*Salicornia depressa*), seashore paspalum (*Paspalum vaginatum*), and shoalgrass (*Halodule wrightii*).

There is little to no vegetation within the project area with the exception of a sparse patches growing on debris piles and the area in front of the damaged bulkhead between Crab Street and Sundial Street. The vegetation in these areas consists primarily of Bermuda grass (*Cynodon* spp.) and various wildflowers. Photos showing the vegetation on the project site are included in *Appendix D*.

The faunal communities in the Gulf Coast Prairies and Marshes natural region typically include coyote, ringtail, hog-nosed skunk, ocelot, and collared peccary. Smaller mammals include Mexican ground squirrel, Texas pocket mouse, northern pygmy mouse, and southern Plains woodrat. Birds of freshwater marshes, lakes, ponds, and rivers include reddish egret, white-faced ibis, black-billed whistling duck, white-fronted goose, and olivaceous cormorant. Reptiles and amphibians include eastern spadefoot toad, Gulf coast toad, American alligator, diamondback terrapin, spiny-tailed iguana, Texas horned lizard, Texas spotted whiptail, and indigo snake (USDA undated). Due to the developed and highly disturbed nature of the project area there is little habitat for faunal communities within the project area. As depicted in the photographs in *Appendix D* the beach is littered with remnants of pier and beam foundations and damaged beach front homes as a result of Hurricane Rita.

Alternative A – No Action: The No Action alternative would have no effect on the flora and fauna of the project area.

Alternative B – Construct Revetment Structure: The construction of a revetment would result in minimal clearing of vegetation. Clearing of vegetation would only occur in the area immediately adjacent to the road. In general, the effects to plants and animals are expected to be minimal.

4.3.2 Threatened and Endangered Species

As shown in *Table 1*, the USFWS lists five species in Brazoria County as being endangered (USFWS 2007). These species are the eastern brown pelican (*Pelecanus occidentalis occidentalis*), Atlantic Hawksbill sea turtle (*Eretmochelys imbricata*), Kemp’s Ridely sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), and whooping crane (*Grus americana*). The USFWS lists four species as being threatened, the bald eagle (*Haliaeetus leucocephalus*), green sea turtle (*Chelonia mydas*), loggerhead sea turtle (*Caretta caretta*), and piping plover (*Charadrius melodus*).

The Endangered Species Act (ESA) of 1973 provides for the protection of all listed threatened and endangered species from take as defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.” Harm is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering.

Coordination with both the USFWS and TPWD has been completed and agency correspondence is included in *Appendix B*. A biological assessment was prepared in conjunction with this EA in accordance with legal requirements set forth under Section 7 of the ESA (16 U.S.C. 1536 (c)) and a concurrence letter from USFWS is included in *Appendix B*.

Table 1
Federal Listed Threatened/ Endangered Species in Brazoria County

Species	Status	Comments
Bald Eagle	Delisted, Recovered	
Eastern Brown Pelican	Endangered	
Green Sea Turtle	Threatened	
Atlantic Hawksbill Sea Turtle	Endangered	
Kemp’s Ridley Sea Turtle	Endangered	
Leatherback Sea Turtle	Endangered	
Loggerhead Sea Turtle	Threatened	
Piping Plover	Threatened	Migratory/ Transient Species
Whooping Crane	Endangered	Migratory/ Transient Species

The following descriptions and status report for each species is based on information provided by the USFWS, the National Marine Fisheries Service (NMFS), TPWD, and the National Parks Service. Emphasis is given to the Kemp’s Ridley sea turtle, known to have nested in Brazoria County; and the piping plover, which winters along the Texas coast and has designated critical habitat southwest of

the proposed project area in Brazoria County, enclosing a length of Gulf beach between the mouth of the Brazos River and FM 1495.

Listed as threatened in 1995, the bald eagle is the second largest North American bird of prey with an average seven foot wingspan. Its white head and tail offset against its dark brown body and wings. They prefer fish but are opportunistic feeders. The range of the bald eagle includes all of the conterminous U. S, and Alaska and is especially common in areas with large expanses of aquatic habitat. Its decline is attributed to the use of the pesticide DDT. Contaminated eagles failed to lay eggs or produced thin eggshells that would break during incubation. The bald eagle has recovered since DDT was banned in 1972 and was proposed for delisting in 1999, but it was determined that additional data was required. Effective August 8, 2007, the bald eagle was delisted from the USFWS list of threatened and endangered species. The bird will still be protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Both laws prohibit killing, selling or otherwise harming eagles, their nests, or eggs.

Breeding occurs primarily in the eastern third of Texas, and wintering occurs wherever open water exists. In 1996, there were an estimated 49 active nests, and in 1997, 305 wintering eagles were reported at a total of 22 sites statewide.

Listed as threatened in 1970, with the exception of the Atlantic coast, Florida, and Alabama populations, the eastern brown pelican is a large dark gray-brown water bird with white about the head and neck. Immature pelicans are gray-brown above and on the neck, with white under parts. Adults may reach up to eight pounds and larger individuals have wingspans of over seven feet. They feed primarily on fish, mostly menhaden and mullet fish. Sand spits and offshore sand bars are used extensively as daily loafing and nocturnal roost areas. The eastern brown pelican is one of six subspecies, and inhabits the Atlantic and Gulf of Mexico coastlines. The eastern brown pelican can be found along the entire Texas coastline. Nesting occurs in early spring or summer in colonies on small coastal islands and identified rookeries are referenced each year in the Texas Colonial Waterbird Census. The eastern brown pelican nearly disappeared from Texas. This was attributed to DDT pesticide poisoning, which caused pelicans to produce thin-shelled eggs that would break easily during incubation. Pelicans have steadily recovered since the use of DDT was banned in 1972. In 1995, it was estimated that there were 2,400 breeding pairs.

Listed as endangered/threatened in 1978, green sea turtles may grow to three to four feet and weigh 400 pounds or more. They are mottled brown in color and derive their name from the greenish fat of the body. Females may nest several times during a season, laying as many as 145 eggs during each nesting event. Greens nest from March to October, with the greatest activity along the Gulf of Mexico beaches between June and August. Green sea turtles range throughout the Atlantic, Pacific, and Indian Oceans, primarily in tropical regions. Presently, they nest primarily on selected beaches along the eastern coast of Florida. The breeding populations off Florida and the Pacific coast of Mexico are listed as endangered, all others, including the nesting and breeding populations off Texas, are threatened. The U.S. recovery team for the green sea turtle concluded that the species status has not improved appreciably since listing. The green sea turtle is an occasional visitor to the Texas coast. All documented nesting activity has occurred on Padre Island National Seashore (PINS). In 1998, a record number of five green sea turtle nests were found. From the five nests, 436 hatchlings were released into the Gulf of Mexico. Since 1998, no more than two nests have been found on PINS in any given year.

Listed as endangered in 1970, the Atlantic Hawksbill sea turtle may grow to 200 pounds and up to three feet in length. They are typically brown in color and are well known for their ornate shells, which are dark amber with radiating streaks of brown or black. Hawksbills are omnivorous, but feed primarily on sponges. They nest every two to three years producing 140-160 eggs per nest and as many as five nests each season. Eggs incubate in the sand for 55-70 days or possibly longer. Hawksbills are found worldwide in tropical and subtropical seas. They nest throughout the Gulf of Mexico and Caribbean and prefer to nest alone on isolated beaches. The primary nesting areas in the U.S. are in Puerto Rico, the Virgin Islands, the southeast coast of Florida, and the Florida Keys. The hawksbills decline is attributed to commercial harvest for their shells and other products including leather, oil, perfume and cosmetics. The Hawksbill's shell still commands a high price and is harvested in many places despite domestic and international laws to protect them. Hawksbills are a very rare visitor to the Texas coast. Only one nest has ever been recorded. In 1998, a nest was found on PINS producing 140 eggs and yielding 132 hatchlings.

Listed as endangered in 1970, the Kemp's Ridley sea turtle is the smallest of all species of sea turtle, averaging about two feet in length and weighing 75-100 pounds. Adult Kemp's Ridley shells are nearly round. Hatchlings feed on available sargassum and associated species found in the Gulf of Mexico. Mature Kemp's Ridelys feed primarily on crabs but also eat shrimp, snails, clams, jellyfish, sea stars and fish. Individuals surviving into adulthood may live 30-50 years.

Female Kemp Ridley's sea turtles are believed to reach sexual maturity between 7-15 years of age. Egg bearing females emerge in the late spring and summer to nest on open sandy beaches. After crawling to an area above the MHHW line, nesters would excavate a chamber with their back flippers and deposit up to 100 leathery, golf ball-sized eggs before covering the nest with sand and returning to the sea. Females may nest one to three times in a single season, preferring to nest in daylight, mostly during the morning hours on windy, overcast days. Eggs incubate in the sand from 45-60 days before the hatchlings emerge and crawl to the sea. Kemp's Ridley sea turtles inhabit the waters of the Gulf of Mexico and the Atlantic Ocean. The primary nesting grounds are at Rancho Nuevo in Tamaulipas, on the eastern coast of Mexico approximately 100 miles south of the Texas border. Historically, nesting has occurred north of Tamualipas, extending onto the southern Texas coastline at levels far below those in Rancho Nuevo. Overall the number of Kemp's Ridley sea turtles has increased during the last decade from six nests in 1996 to 102 nests in 2006 (PINS, 2007).

Listed as endangered in 1970, the leatherback sea turtle is the largest species of sea turtle, sometimes reaching six feet (carapace length) and over 1,000 pounds. They are black in color, have seven prominent ridges on their backs, and are covered by a smooth, leathery skin instead of shell. Leatherbacks feed mostly on jellyfish, and are therefore susceptible to ingesting discarded plastic by mistake. They are found primarily in tropical and subtropical seas, however, they have been found as far north as Iceland and Norway, and, in the Pacific, as far south as New Zealand and Chile. Major nesting grounds in the Atlantic are on the northern coast of South America and at various locations around the Caribbean. There is minimal nesting in Florida and the Gulf of Mexico. The U.S. recovery plan for leatherback sea turtles concluded that nesting trends in the U.S. appear stable, but face significant threats from commercial fisheries and marine pollution. Leatherbacks are not known to currently nest in Texas. No nests have been reported since the 1930s, all of which were recorded on PINS.

Listed as threatened in 1978, loggerhead sea turtles are characterized by their large heads and powerful jaws. They are reddish brown in color and can reach four feet in carapace (shell) length and can weigh up to 500 pounds. Females typically nest at night on open sandy beaches above the

high tide line. They may nest several times in a given season (late spring and summer), laying up to 190 eggs per nest. The eggs incubate in the sand for 55-62 days before the hatchlings emerge and crawl to the sea. Loggerhead sea turtles are found worldwide in tropical and temperate waters that include the Gulf of Mexico, Caribbean Sea, and Atlantic Ocean. Recent evidence indicates that nesting trends for the loggerhead are generally declining. On January 14, 2002, the NMFS received a petition to reclassify the Northern and Florida Panhandle subpopulations of the loggerhead sea turtle as distinct population segments with endangered status and to designate critical habitat. NMFS published a 90-day finding stating the petition presented substantial information that the reclassification may be warranted and announcing the initiation of a status review. On September 9, 2003, after review of all available scientific and commercial information, the USFWS found that the loggerhead does not meet the criteria for classification as DPSs. The loggerhead is an occasional visitor to Texas with only minor and solitary nesting occurring along the coasts of the Gulf of Mexico. There have been very few nesting events on the upper Texas coast. One loggerhead nest was recorded on Bolivar Peninsula in 1996, and an unsuccessful nesting attempt was reported on Galveston Island in 2003. In 2006, two nests were recorded, one at PINS and another on South Padre Island.

Listed as threatened in 1985, the piping plover is a small, stocky, sandy-colored bird with orange legs resembling the sandpiper. Plumage depends upon the season. Breeding adults have a black band across the forehead from eye to eye, and a black ring around the base of the neck. Wintering adults (those found in Texas) lose the black markings. The piping plover blends well into the pale background of open, sandy habitat on outer beaches where it feeds and nests. Breeding pairs are monogamous, and typically nest somewhere on the high beach near the dunes, where available. The nest is often lined with small stones or fragments of shell. The average clutch size is four eggs, which hatch in around 25 days. The piping plover migrates annually between its breeding and wintering grounds. The plover inhabits its breeding grounds from March to August and its wintering grounds from September to April. In 2001, the USFWS designated 37 critical habitat units for wintering piping plovers in Texas, which extend from the east side of Rollover Bay in Galveston County to the mouth of the Rio Grande. Critical habitat unit TX-33 encloses 388 acres of Gulf beach in Brazoria County, stretching from the mouth of the Brazos River to FM 1495. The project area is approximately 3.5 miles north of the northern most boundary of TX-33. Surveys estimate that there are less than 1,400 breeding pairs remaining in the Atlantic coast population, 32 pairs in the Great Lakes population (U.S. only), and 5,938 individuals remaining in the Northern Great Plains population.

Listed as endangered in 1967, the Whooping crane is the tallest bird in North America, standing at 5 feet tall. They have a long, sinuous neck, long legs, and its snowy white body feathers are accented by jet-black wingtips and a red and black head with a long, pointed beak. Whooping cranes roost in wetlands and upland grain fields and feed on insects, minnows, crabs, clams, crayfish, frogs, rodents, small birds, and berries. In 1870 whooping cranes were estimated at 500 to 700 individuals. Their numbers have declined as much of their breeding and wintering habitat has been lost to agricultural development. By 1941 only 16 individuals remained. In 2003, with extreme recovery efforts the total population stood at 434 birds, including those in captivity and in the wild. The Whooping crane breeds in the wetlands of Wood Buffalo National Park in northern Canada and winters on the Texas coast at Aransas National Wildlife Refuge near Rockport from approximately October 15 to April 15. This is the only self-sustaining population in existence. Whooping cranes have occasionally been sighted in Brazoria County: two birds were presumed to have wintered in the Jones Creek area in 1986, one bird wintered in the Jones Creek and Angleton areas in 1998, and three birds were sighted one mile west of Columbia in 2003.

Alternative A - No Action: The No-Action alternative would have no effect on threatened and endangered species.

Alternative B – Construct Revetment Structure:

The proposed construction is expected to have no effect on the following species:

- The bald eagles for the following reasons: they nest in large, tall trees near quiet coastal areas, rivers or lakeshores, which are not present at the project area; the closest bald eagle nest to Surfside Beach is located east of Lake Jackson along Oyster Creek; and non-nesting eagles may be found in nearby coastal prairie, but it is unlikely that construction activities would impact these individuals.
- The green sea turtles, Atlantic Hawksbill sea turtles, leatherback sea turtles because of their lack of historical presence on the upper Texas coast, Brazoria County and the project area.
- The Whooping cranes for the following reasons. Wintering in the Brazoria County area has been sparse, occurring in upland wetland habitat and most likely salt marsh complexes similar to those found at the Aransas National Wildlife Refuge. There is no known habitat located within the immediate vicinity of the project area.

The proposed construction is not expected to adversely effect on the following species:

- The loggerhead sea turtles because of their low historical presence on the upper Texas coast, and lack of historical presence in Brazoria County and the project area.
- The piping plovers for the following reasons. No construction activities would occur on designated critical habitat. Organisms in the beach and dune system, including the piping plover's food sources, are believed to recover quickly from temporary disturbance caused by construction activities.
- The Kemp's Ridley sea turtle for the following reasons: the project area is highly disturbed as a result of Hurricane Rita, as depicted in the photographs in Appendix D. The beach is littered with remnants of pier and beam foundations and damaged beach front homes; and the avoidance and minimization measures discussed in *Section 9.0*.

Any effect from the proposed project on the eastern brown pelican would be insignificant; however beach observers would be trained to identify eastern brown pelicans and what actions to take if these pelicans are observed on the beach.

4.4 Air Quality

The Clean Air Act requires that states adopt ambient air quality standards. The standards have been established in order to protect the public from potentially harmful amounts of pollutants. The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six air pollutants. These pollutants include sulfur dioxide, particulate matter with a diameter less than or equal to ten micrometers, carbon monoxide, nitrogen dioxide, ozone, and lead. The EPA has designated specific areas as NAAQS attainment or non-attainment areas. Non-attainment areas are any areas that do not meet (or that contribute to ambient air quality in a nearby area that does not meet) the quality standard for a pollutant. Attainment areas are any areas that meet ambient air quality standards. According to the EPA, Brazoria County is part of the Houston-

Galveston-Brazoria non-attainment region which is currently designated as moderate non-attainment for the eight-hour ground level ozone standard. The deadline set for achieving attainment for eight-hour ground level ozone levels has been set June 15, 2010 (TCEQ 2007).

Alternative A – No Action: The No Action alternative would have no effect on air quality.

Alternative B – Construct Revetment Structure: Pollutant emissions from construction equipment may result in minor temporary effects to air quality in the area immediately surrounding the proposed construction activity. Vehicular exhaust emissions would be produced by the operation of diesel engines and other construction equipment. The contractor would be required to keep all equipment in good working order to minimize air pollution. These effects would be localized and of short duration.

4.5 Transportation

The proposed revetment structure would be constructed along the seaward side of Beach Drive beginning 150 feet west of Texas Street and continuing uninterrupted to the east approximately 3,500 feet to Whelk Street (refer to *Appendix A* and *Figure 2*). Beach Drive is a residential road within the Village of Surfside Beach, which runs parallel to the shoreline. This road is important to the community in that it provides beach access. In addition it provides the only point of access for the row of homes located landward of Beach Drive.

Alternative A – No Action: The No Action alternative would leave Beach Drive unprotected, and could potentially result in damage to the road and even loss of the road if left unprotected.

Alternative B – Construct Revetment Structure: Construction of the proposed revetment structure may have a small effect on transportation by increasing the number of construction related vehicles on Beach Drive. The increase would be expected to be minor and would be due to construction workers traveling to and from the construction site. Access along Beach Drive would be maintained during construction. Once the project is completed, traffic levels would be expected to return to preexisting levels.

4.6 Noise

Noise is generally defined as unwanted sound. The closest noise receptors are the homes located on the landward side of Beach Drive. Noise levels within and adjacent to the project area would increase during the proposed construction activities as a result of construction equipment and vehicular traffic. The noise levels generated would be limited to workday daylight hours for the duration of the construction work.

Alternative A – No Action: The No Action alternative would not result in impacts to noise receptors in the area.

Alternative B – Construct Revetment Structure: Construction of the proposed revetment structure would result in an increase in noise during the construction of the structure. Construction would be limited to daylight hours only. The increase in noise is expected to be minor and would not affect any sensitive receivers.

4.7 Cultural Resources

Section 106 of the National Historic Preservation Act of 1966, as amended requires federal agencies “to take into account” the “effect” that an undertaking would have on “historic properties”. Historic properties are those included in or eligible for inclusion in the National Register of Historic Places (NRHP) and may include archeological sites, buildings, structures, sites, objects, and districts. In accordance with the Advisory Council on Historic Places regulations pertaining to the protection of historic properties (36 CFR 800.4), federal agencies are required to identify and evaluate historic-age resources for NRHP eligibility and assess the effects that the undertaking would have on historic properties.

A search of the Texas Historic Sites Atlas found no listings of National Register properties on or adjacent to the project site. A search of the NRHP Register for Places, Districts, and Historical Markers, found no listings of within a half mile of the project site. Coordination with the Texas Historical Commission was initiated to provide information regarding potential archeological properties and National Register eligibility.

Alternative A – No Action: The No Action alternative would have no effect on cultural resources in the area.

Alternative B – Construct Revetment Structure: The Texas Historical Commission was contacted by letter regarding the potential for archeological or historic resources to be impacted by the proposed project. The adjacent residential properties and Beach Drive are all less than 45 years of age and do not meet the criteria for inclusion in the National Register, therefore no historic buildings or structures would be affected by the proposed project. As the area is a developed residential area with underground utilities and the proposed revetment would be construction directly adjacent to Beach Drive, there is low potential for impacts to archeological resources as the area is previously disturbed. The Texas Historical Commission concurred with FEMA’s finding that no building listed or eligible for listing on the NRHP would be affected and the proposed project is located on previously disturbed ground (letter attached in *Appendix B*).

In the event that archeological deposits, including any Native American pottery, stone tools, bones, or human remains are uncovered the project would be halted and the Village of Surfside Beach would stop all work immediately in the vicinity of the discovery and take reasonable measures to avoid or minimize harm to the finds. All archeological findings would be secured and access to the sensitive area restricted. The Village of Surfside would inform FEMA and the GLO immediately and FEMA would consult with the SHPO or THPO and Tribes. Any work in sensitive areas would not resume until consultation has been completed and appropriate measures have been taken to ensure that the project is in compliance with the National Historic Preservation Act.

4.8 Socioeconomic

The project is located in the Village of Surfside Beach in eastern Brazoria County. According to the Census 2000, the Village of Surfside Beach has a population of 736 and a per capita income of \$24,081 (U.S. Census Bureau 2000). In comparison, Brazoria County has a population of 241,767 and a per capita income of \$20,021 (U.S. Census Bureau 2000). The primary industries in Brazoria County are based on petrochemical and petroleum industries, manufacturing, tourism, fishing and agribusiness (GLO 2002).

At the time of the site visit there were 27 homes located within the project area seaward of Beach Drive. A review of an aerial photo indicated that there were at one time 30 homes located within the project area. These homes appeared to be largely vacation rental properties; however some of them may have been owner occupied. Two of the homes were in the process of being removed at the time of the preparation of the EA and the power appeared to have been disconnected from the rest.

Alternative A – No Action: The No Action alternative would entail no construction of a revetment structure for the Village of Surfside Beach. Consequently Beach Drive, the adjacent utilities and homes landward of Beach Drive would be left unprotected and erosion would continue unabated. This would result in a monetary burden to the community; and the loss of Beach Drive and the public utilities. The total estimated monetary value of these facilities is approximately \$8,909,255 (Kelly Hamby, Village of Surfside, telephone conversation, June 7, 2007).

Alternative B – Construct Revetment Structure: Construction of a revetment on Surfside Beach would facilitate and/or support economic growth by protecting the utilities and public infrastructure along Beach Drive. In addition, the construction of the revetment would be expected to create jobs in the short term.

4.9 Environmental Justice

Executive Order 12898, entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” mandates that deferral agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of programs on minority and low-income populations. This Executive Order also tasks federal agencies with ensuring that public notifications regarding environmental issues are concise, understandable, and readily accessible. Socioeconomic and demographic data were studied to determine if a disproportionate number of minority or low-income persons have the potential to be adversely affected by the proposed project.

The 2000 Census lists 92.7 percent of the Village of Surfside residents as white and therefore 7.3 percent as a minority consisting of Black or African Americans, American Indians, Alaska Natives, Asians, Native Hawaiians and Other Pacific Islanders. Of the 763 residents of Surfside Beach 3.9 percent identify themselves as Hispanic or Latino. The median family income in 1999 was \$43,333 and 10.4 percent of families were below the poverty level (U.S. Census Bureau 2000).

In comparison, the 2000 Census lists 77.1 percent of Brazoria County’s residents as white and therefore 22.9 percent as a minority. Of the 241,767 residents, 22.8 percent identify themselves as Hispanic or Latino. The median family income in 1999 is \$55,282 and 8.1 percent of families were below the poverty level (U.S. Census Bureau 2000).

Alternative A – No Action: The No Action alternative would not have disproportionate impacts on minority or low-income populations in the Village of Surfside or in Brazoria County.

Alternative B – Construct Revetment Structure: Construction of the revetment would not involve any relocations or have an adverse or disproportionate impact on minority or low-income populations. The benefits of a flood protection wall are expected to be proportional to all residents in the area.

4.10 Safety

Safety and security issues that were considered in this EA include the health and safety of area residents, the public at-large, and the protection of personnel involved in activities related to the implementation of the proposed project.

Alternative A – No Action: The No Action alternative could have a negative effect on the general safety of the residents in the Village of Surfside Beach. The lack of adequate protection for Beach Drive and the adjacent utilities and infrastructure would put the community at unnecessary risk and in the event of another damaging storm.

Alternative B – Construct Revetment Structure: The construction of the revetment structure would provide protection to Beach Drive and the adjacent utilities and infrastructure. This would allow the community to continue to receive access to the road and services from the city in the event of a large storm event.

4.11 Hazardous Materials

Hazardous wastes, as defined by the Resource Conservation and Recovery Act (RCRA), are defined as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may; (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or; (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of or otherwise managed.”

Hazardous materials and wastes are regulated in Texas by a combination of federal laws and state laws. Federal regulations governing the assessment and disposal of hazardous wastes include RCRA, the RCRA Hazardous and Solid Waste Amendments, Comprehensive Environmental Response, Compensation and Liability Act, Solid Waste Act, and Toxic Substances Control Act.

Visual observation of the project area did not reveal obvious existing or potential hazardous materials, substances, or conditions. No drums or other sources of potential hazardous materials were observed in the project area. There were indications that some of the preexisting infrastructure including utility poles and transmission lines associated with the homes being removed from the beach were still in place. These items are considered waste and would be either removed prior to the construction of the proposed revetment structure or if encountered during the construction of the proposed revetment structure. No indications of pipelines crossing the project area were noted in the field or on the USGS topographic map reviewed for this project. No evidence of overhead electrical transformers potentially containing polychlorinated biphenyls was noted in the field.

The following is a list of the federal and state databases reviewed for this project: EPA, National Priorities List, EPA Comprehensive Environmental Response, Compensation and Liability Information System List, EPA Resource Conservation and Recovery Information System List, TCEQ Superfund Registry, TCEQ Leaking Petroleum Storage Tank List, and TCEQ Petroleum Storage Tank List. The databases were searched by zip code and by the municipality of Village of Surfside Beach, Texas. There were three petroleum storage tanks registered with the TCEQ PST List, no other facilities or properties were listed in the database searches.

Alternative A – No Action: The No Action alternative would not disturb any hazardous materials or create any potential hazard to human health.

Alternative B – Construct Revetment Structure: Construction of the proposed revetment structure would not disturb any hazardous materials or create any potential hazard to human health. If hazardous constituents are unexpectedly encountered in the project area during the proposed construction operations, appropriate measures for the proper assessment, remediation and management of the contamination would be initiated in accordance with applicable federal, state, and local regulations. The contractor would take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area.

5.0 CUMULATIVE IMPACTS

Cumulative impacts are those effects on the environment that result from the incremental effect of the action when added to past, present and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The only known projects planned within the vicinity of the proposed project are the other phases mentioned in *Section 3.2* and a beach nourishment project including: Phase 1 is underway and consists of concrete/debris removal and the demolition, removal and/or relocation of the damaged homes seaward of Beach Drive; Phase 4 which includes implementation of the projects developed in the Shoreline Feasibility Study including a beach nourishment, dune reconstruction and beach stabilization project; and a beach nourishment project southwest of the proposed project at Quintana Beach. There are potential impacts from these past and foreseeable future actions including potential disturbance of nesting turtles and direct burial of turtle nests. However, if the avoidance and minimization measures discussed in *Section 9.0* were employed in these projects, the potential for adversely impacting sea turtles would be greatly reduced. These projects, should they occur, would also be restorative in nature and beneficial to the beach and community by rebuilding shoreline habitat. There are no other known projects that, when added to these projects and the proposed rock revetment structure, would have a cumulative impact on the human environment.

6.0 PUBLIC INVOLVEMENT

A legal notice of availability for the Draft EA was published in the *The Facts* and the *Houston Chronicle* on June 19, 2007, and the Draft EA was made available on the FEMA website and at the Freeport Public Library for a 30-day period. One comment was received from the TPWD (see letter dated July 13, 2007 in *Appendix F*). The recommendations noted in this letter will be implemented by the Village of Surfside as practicable.

A legal notice of availability for the Final EA was published in *The Facts* on August 29, 2007, and the Final EA was made available on the FEMA website.

Legal notices are included in *Appendix E*.

7.0 AGENCY COORDINATION AND PERMITS

As part of the development of this EA federal resource protection agencies were contacted. Because the project would disturb more than one acre, a TCEQ TPDES storm water permit would be required. It is anticipated that no other permits or approvals would be needed from any of the other regulatory agencies; however, the following agencies have been contacted and asked to comment on the proposed project:

- Texas Historical Commission
- Texas Parks and Wildlife Department
- U.S. Fish and Wildlife Service

FEMA initiated early coordination with all potentially impacted tribes. No requests for coordination were received from the tribes that were contacted.

On January 10, 1997, the State of Texas received federal approval of the Coastal Management Program (CMP). Under federal law, federal agency activities and actions affecting the Texas coastal zone must be consistent with the CMP goals and policies identified in 31 TAC Chapter 501. The proposed project is within the boundaries of the CMP. Additionally, the requirements for federal consistency review apply to entities seeking federal assistance (31 TAC Chapter 506.12). As such, the Village of Surfside Beach and/or the Texas General Land Office has coordinated with the Coastal Coordination Council to ensure that the proposed project is consistent with the goals and policies of the Texas CMP (letter and email are attached in *Appendix B*).

Agency response letters are attached in *Appendix B*.

8.0 CONCLUSION

The findings of this EA conclude that the proposed construction of an revetment structure in the Village of Surfside Beach along the seaward side of Beach Drive would result in no significant environmental impacts to the human or natural environment; therefore, the proposed action meets the requirements of a Finding of No Significant Impacts (FONSI) under NEPA and the preparation of an Environmental Impact Statement (EIS) would not be required. FEMA nor the GLO considers this project a typical solution, however without the proposed revetment, the erosion rates would remain unabated and would result in the loss of Beach Drive, the public utilities, and the two rows of homes landward of Beach Drive. It would also not allow for any of the other phases mentioned in *Section 3.2* to be completed, including the beach nourishment, dune reconstruction and shoreline stabilization project.

9.0 MITIGATION

General mitigation measures and conditions are expected to be required of the applicant prior to authorization of federal funding. These conditions are expected to include, but not be limited to:

Because the project would disturb more than one acre, a TCEQ TPDES storm water permit would be required. This permit would require that a copy of the Storm Water Pollution Prevention Plan is kept on the construction site and that all sediment control measures identified in this plan are maintained.

This project would comply with the GLO beach and dune rules.

A comment was received from the TPWD (see letter dated July 13, 2007 in *Appendix F*). The recommendations noted in this letter would be implemented by the Village of Surfside where practicable.

The following avoidance and minimization measures would reduce the potential impact to the piping plover and Kemp's Ridley sea turtle as well as other listed sea turtle species which exhibit similar

nesting characteristics. While it is unlikely that a loggerhead would nest at the project area, and even less likely that a green, Hawksbill, or leatherback would nest in the project area, the potential for adversely impacting these sea turtle species and piping plovers are greatly reduced as a result of adhering to these avoidance and minimization measures. As practicable, construction would occur outside of the Kemp's Ridley nesting season from April 1 to September 1; however if this is not practicable additional avoidance and minimization measures (numbers 1-11) would be incorporated into the proposed project:

1. An independent, qualified observer or observers would be hired by the Village of Surfside Beach to monitor all construction activities, escort construction vehicles to and from the work site, and monitor for the presence of threatened and endangered between April 1 and September 1.
2. To prevent undetected nesting from occurring in the project area prior to construction, community volunteers would survey the beach adjacent to and along the project area twice daily for nesting sea turtles and their tracks beginning April 1 and continuing until construction begins. Volunteers would be required to attend a half-day training session to learn how to identify nesting sea turtles and piping plovers; and what actions should be taken if these species are observed.
3. An education and outreach workshop would be organized for the public to provide the residents of Surfside Beach and surrounding areas with information about the proposed project, nesting sea turtles and piping plovers.
4. Educational signs would be developed and displayed at various locations around Surfside Beach and the project area, informing the public about nesting sea turtles and piping plovers and what actions should be taken if these species are observed.
5. Work crews would be required to attend a half-day training session to learn how to recognize and avoid impacts to nesting sea turtles and piping plovers and what actions should be taken if these species are observed.
6. The Village of Surfside Beach would ensure that the independent monitor(s) survey the beach adjacent to and along work areas before work begins each morning and again after work concludes; and periodically throughout the day at such times deemed necessary by the independent monitor. This would occur between April 1 and September 1.
7. No work would continue after dark, therefore no artificial lighting would be necessary.
8. All construction activities would occur from Beach Drive, therefore no construction related vehicles would be on the beach at any time.
9. The number of vehicles transiting from the upland areas to the work site would be kept to a minimum, all vehicles would use the same pathways, and access would be confined to the immediate project area.
10. No temporary, overnight storage of earth-moving equipment on the beach would be allowed. At the conclusion of each workday, vehicles would be parked on the county right-of-way.
11. In the event that a Kemp's Ridley sea turtle or its nest is encountered in or adjacent to the project area, construction activities would cease and the U.S. Fish and Wildlife Service (USFWS) would be contacted. In the event that a piping plover is encountered, the independent monitor(s) would be contacted for further guidance.

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